HP ProLiant BL p-Class SAN storage connectivity

technology brief, 2nd edition

Abstract

This paper describes the hardware and software required to connect HP ProLiant BL p-Class server blades to Fibre Channel Storage Area Networks (SANs).[1]

Introduction

HP ProLiant BL p-Class server blades provide high performance and high availability for multi-tiered data center architectures. The family of ProLiant BL p-Class server blades includes the dual-processor BL20p G3, BL25p, BL30p, and BL35p servers and the four-processor BL40p and BL45p servers. The ProLiant BL p-Class server blades have the optional ability to quickly access enterprise data in Fibre Channel Storage Area Networks (SANs). Fibre Channel SANs provide high-performance, robust, consolidated, and manageable storage environments. This paper identifies the hardware and software required to connect these server blades to Fibre Channel SANs.

Hardware for SAN connectivity

This section describes the hardware required to connect ProLiant BL p-Class server blades to Fibre Channel SANs. This section does not include information about selecting the BL p-Class power enclosure, power supplies, and power distribution devices. For that information, please refer to the QuickSpecs for the Fibre Channel interconnect module.

ProLiant BL p-Class enclosure

The ProLiant BL p-Class server blade enclosure (Figure 1) is a 6U (height 10.5 inches, 266.7 mm) chassis with ten bays for server blades and interconnect modules. The two outside bays are for interconnect modules: the RJ-45 Patch Panel 2, the Gigabit Ethernet 2 (GbE2) Interconnect Switch, or switch options from Cisco. Brocade and McDATA Fibre Channel switches plug into the back of the interconnect modules, which are described in subsequent sections.

Figure 1. BL p-Class 6U enclosure with eight bays for server blades and two bays for interconnect modules
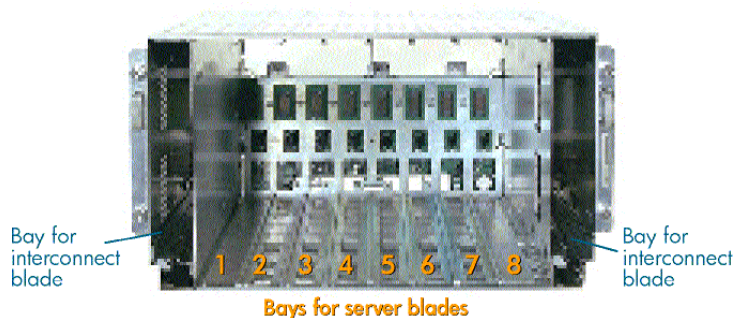
The eight interior bays can house two ProLiant BL40p server blades, four BL45p server blades, eight ProLiant BL20p G3 or BL25p server blades, or sixteen half-height BL30p or BL35p server blades (or combinations of these models). The bays are designed so that the server blades and interconnect modules slide in and connect to the enclosure backplane for power and data connections, including dual-path Fibre Channel connections for the ProLiant BL20p G3, BL25p, BL30p, BL35p, and BL45p

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[1] For information about supported HP StorageWorks SAN configurations, refer to the "HP StorageWorks SAN design reference guide" at
http://h20000.www2.hp.com/bc/docs/support/SupportManual/c00403562/c00403562.pdf.

servers. The enclosure backplane routes both Ethernet and Fibre Channel signals from the server blades to the interconnect bays. The ProLiant BL40p server requires routing Fibre Channel fiber optic cables to an optional host bus adapter (HBA) in the back of the BL40p.

ProLiant BL30p and BL35p server blades

The ProLiant BL30p server blade supports up to two Intel® Xeon™ processors and up to 4 GB of PC2100 DDR memory. The ProLiant BL35p server blade supports up to two AMD Opteron 200 Series processors and up to 8 GB of PC3200 DDR2 memory. Both server blades are optimized to deliver high performance with Fibre Channel SAN storage.

The BL30p and BL35p server blades offer an optional dual-port Fibre Channel HBA mezzanine card that provides support for SAN implementations that enable:

- clustering capabilities
- data center consolidation
- high availability
- rapid application deployment

The dual-port Fibre Channel HBA attaches to the server via a connector on the mezzanine card (also known as a balcony card) shown in Figure 2. The server blades support HP StorageWorks SANs and select, third-party Fibre Channel SANs (see the Supported SANs page at http://h18004.www1.hp.com/products/blades/components/storage.html#4).

The half-height design of the BL30p and BL35p server blades allows inserting up to two of these servers into an enclosure sleeve that forms a Fibre Channel loop between the two servers and a Fibre Channel Switch Port or Fibre Channel Pass-Thru Module. The enclosure sleeve installs into a single server bay in the BL p-Class enclosure. Thus, one BL p-Class enclosure can hold up to 16 BL30p or BL35p server blades (for a total of up to 32 processors).

Each server sleeve connects to an interconnect module. The interconnect modules make the connection between the server sleeves and the external SAN. Some interconnect modules make a direct connection to the SAN; others require a SAN connectivity kit and a Fibre Channel Pass-Thru Module or a Fibre Channel Switch.

Figure 2. Dual-port Fibre Channel mezzanine card for ProLiant BL30p and BL35p server blades
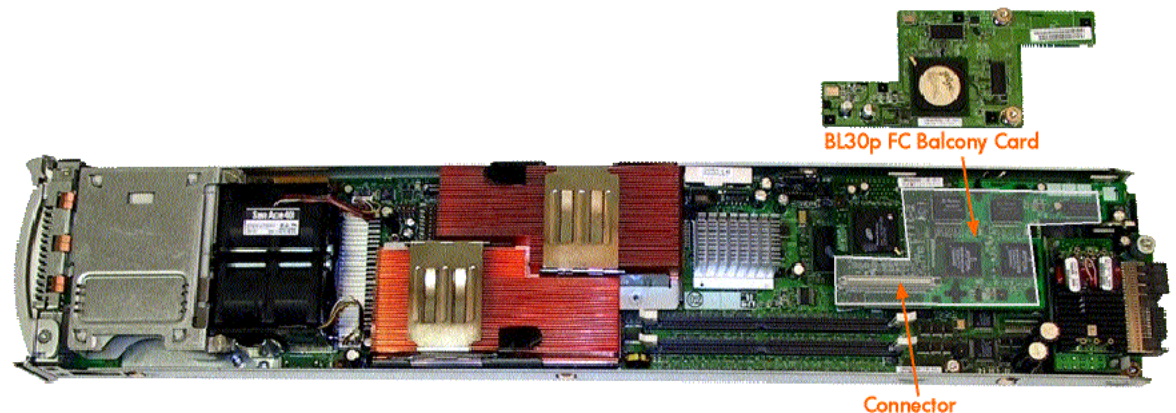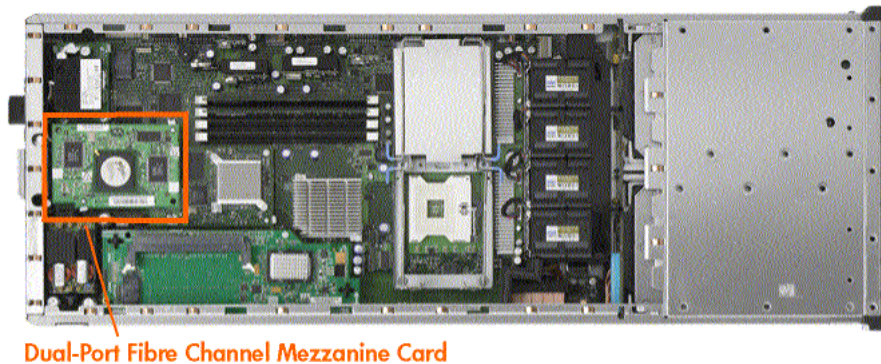
ProLiant BL20p G3 and BL25p server blades

The ProLiant BL20p G3 supports up to two Intel Xeon processors, up to 8 GB of PC 3200 DDR2 memory, four embedded gigabit NICs (standard) plus one 10/100T NIC dedicated to iLO, and SAN storage connectivity. The BL20p G3 server blade supports Fibre Channel SAN connectivity using a dual-port Fibre Channel mezzanine card (Figure 3). The Fibre Channel mezzanine card is a combination network and Fibre Channel HBA. It is optimized for HP StorageWorks products, but it is also compatible with EMC, Hitachi, and IBM SANs (see the Supported SANs page at www.hp.com).

HP ProLiant BL20p G3 (left) and BL25p server blades

The ProLiant BL25p dual-processor server blade delivers enterprise availability and scalability to run existing 32-bit applications, while also providing a simplified migration path to 64-bit computing. The BL25p server blade supports up to two AMD Opteron 200 Series processors, up to 16 GB of PC3200 DDR2 memory, four embedded gigabit NICs (standard) plus one 10/100T NIC dedicated to iLO, and SAN storage connectivity. The BL25p server blade supports Fibre Channel SAN connectivity using a dual-port Fibre Channel mezzanine card (see the "Fibre Channel adapters" section of this paper).

Figure 3. Dual-port Fibre Channel mezzanine card for ProLiant BL20p G3 SAN connectivity

Dual-Port Fibre Channel Mezzanine Card

ProLiant BL45p and BL40p server blades

The ProLiant BL45p server blade supports up to four AMD Opteron™ 800 Series processors. Up to four BL45p server blades fit in a 6U enclosure. The BL45p does not have expansion slots; it supports Fibre Channel with an optional dual-port Fibre Channel adapter. The BL45p requires an interconnect kit option with Fibre Channel pass-thru capability, such as the ProLiant BL p-Class RJ-45 Patch Panel 2, ProLiant BL p-Class GbE2 Interconnect Switch with the GbE2 Storage Connectivity Kit option, or Cisco Gigabit Ethernet Switch Module (CGESM) Interconnect Switch.

ProLiant BL45p (left) and BL40p server blades

The ProLiant BL40p server blade features four Xeon MP sockets and two 64-bit PCI-X expansion slots. Up to two BL40p server blades fit in a 6U enclosure. The BL40p server blade provides optional SAN connectivity through the two 64-bit PCI-X expansion slots (Figure 4) where customers can install up to two Fibre Channel HBAs. To connect the ProLiant BL40p server blade to StorageWorks SAN switches

and SAN devices, HP recommends using StorageWorks Fibre Channel HBAs. If desired, the HBAs can be configured for redundancy when they are connected to a SAN designed with dual paths.

For the most up-to-date and complete listing of StorageWorks SAN switches and Fibre Channel HBAs, visit the StorageWorks SAN Infrastructure Web page at http://h18006.www1.hp.com/storage/saninfrastructure.html. Alternatively, the ProLiant BL40p offers EMC, Hitachi Data Systems (HDS), and IBM SAN customers the choice to connect to their third-party SANs using existing Fibre Channel HBAs. These customers should consult their SAN provider for details on which configurations and devices to use.

Figure 4. ProLiant BL40p PCI-X expansion slots
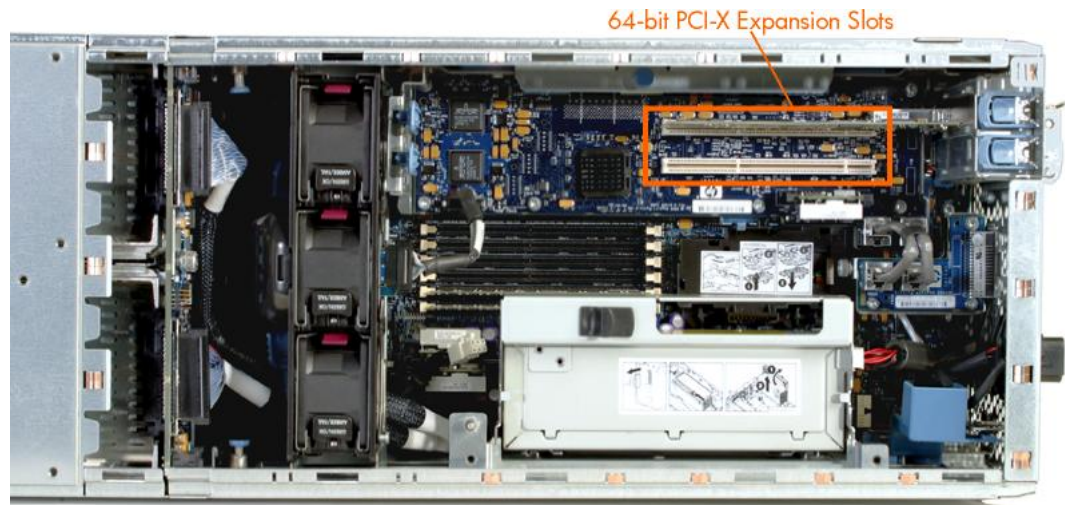
Fibre Channel adapters

The QLogic Fibre Channel mezzanine card is based on the ISP2312 chipset. The Emulex Fibre Channel mezzanine card is based on the Emulex Thor chipset. These dual-part Fibre Channel adapters for the ProLiant BL20p G3, BL25p, BL30p, BL35p, and BL45p provide the following features:

• RDP scripted installation for Microsoft® Windows® and Linux® operating systems
• Boot capability from SAN disk or LUN
• Blade bay to FC switch compatibility established by the server blade
• High availability through redundant paths

The Fibre Channel adapters provide two Fibre Channel ports using a dual-port controller chip. The two ports can be configured as active-active or active-passive, depending on the architecture of the attached SAN and customer preference. The Fibre Channel ports provide a maximum data transfer rate of 2 Gb/s per port (per direction). By default, both ports are set to support auto-negotiation to the highest common transfer rate between the HBA and existing 1-Gb/s Fibre Channel equipment. It is recommended that the user determine the speed (data transfer rate) at which existing equipment runs, and then force the data rate to that speed. Forcing the HBA to use a fixed data rate will allow ports to initialize faster.

When one of the server blades is installed in the enclosure bay, the ports on the mezzanine card
connect directly to the enclosure backplane. Once customers install the server blade with the Fibre
Channel mezzanine card, they have three interconnect options for linking the server blade to a SAN:

- BL p-Class Patch Panel 2 Kit
- GbE2 Interconnect Switch Kit along with the GbE2 Storage Connectivity Kit
- Cisco Gigabit Ethernet Switch Module

Industry-standard, Small Form-factor Pluggable (SFP), Fibre Channel optical transceivers can be used
for Fibre Channel switches. The "ProLiant BL p-Class interconnects" section of this paper describes
how these transceivers are used with the appropriate interconnect.

The Fibre Channel adapter for the ProLiant BL30p and BL35p has a different subvendor ID than the
ProLiant BL20p G3, ProLiant BL25p, and ProLiant BL45p dual-port Fibre Channel mezzanine cards.
Because the Windows driver is subvendor-ID-sensitive, a new, backward-compatible driver was
introduced with the ProLiant BL30p and the ProLiant BL35p server blades. Linux drivers are not
subvendor-ID-sensitive, so the currently available Linux drivers are compatible.

With the BL30p or BL35p server blade and Fibre Channel Balcony Card, Fibre Channel port
aggregation is required to accommodate the increased number of server Fibre Channel HBA ports
and to maintain compatibility with the available enclosure backplane signals and interconnect ports.
The server blade enclosure sleeve aggregates the four signal paths from two BL30p or BL35p server
blades into two physical paths, one to each of the two I/O interconnect modules. Up to eight physical
Fibre Channel ports connect from the left interconnect module, and up to eight physical Fibre Channel
ports connect from the right interconnect module. Interconnect modules can be a RJ-45 Patch Panel 2,
GbE2 Interconnect Switch, or Cisco Gigabit Ethernet Switch Module. SFPs allow the RJ45 Patch
Panel 2 to connect directly to an external Fibre Channel SAN switch. To connect to the SAN, the
GbE2 Interconnect Switch or the Cisco Gigabit Ethernet Switch Module requires installation of a SAN
Interconnect Kit and a Pass-Thru Module with SFP, or installation of a Fibre Channel Switch with SFPs.
All of the options for Fibre Channel used with the BL30p and BL35p servers require support for Fibre
Channel Arbitrated Loop (FCAL) public loop log-in. Public Loop operation will occur at the SFP
connection on the RJ-45 Patch Panel connections and at the Fibre Channel Pass-Thru connected to the
GbE2 Interconnect Switch or to a Cisco Gigabit Ethernet Switch Module.

Fibre Channel switches such as the Brocade 4-Gb SAN Switch for BladeSystem p-Class and the
McData 4-Gb SAN Switch for BladeSystem p-Class isolate the loop operation from the external
connections to the SAN. Many Fibre Channel external switches provide public loop support; however,
some SAN vendors carry models that do not provide FCAL support. For a list of SAN switches that
support FCAL public loop login, contact the SAN vendor.

ProLiant BL p-Class interconnects

This section describes interconnect options for Fibre Channel SAN connectivity: the RJ-45 Patch Panel 2 Kit and GbE2 Interconnect Kit. It also shows connection schemes using these two interconnect kits.

Interconnect decision matrix

Table 1 (on the following page) is an interconnect decision matrix to assist in choosing the appropriate interconnect to use with ProLiant BL20p G3, BL25p, BL30p, BL35p, and BL45p server blades.

If it is important to reduce the number of Ethernet networking cables and to achieve high-performance, switched Ethernet transfers between servers, the GbE2 Interconnect Kit or the CGESM may be the correct choice. To add FC SAN connectivity to the GbE2 Interconnect Kit or CGESM, HP recommends that users add one of the 4-gigabit SAN switches for HP BladeSystem p-Class to the interconnect module. The GbE2 Interconnect Switch or CGESM can be removed or replaced without disconnecting and reconnecting the Ethernet or Fibre Channel cables.

If SAN connectivity is required but Fibre Channel switching and Ethernet networking cable reduction are not required, the RJ-45 Patch Panel 2 Kit may be the correct choice, if the customer already has one. When using the RJ-45 Patch Panel 2 Kit, the Fibre Channel cables from external SAN switches will connect to the front of the Patch Panel 2 Interconnect.

4-Gb SAN switches for ProLiant p-Class server blades

Two SAN interconnect module options are available: the Brocade 4-Gb SAN Switch for HP p-class BladeSystem and the McDATA 4-Gb SAN Switch for HP p-class BladeSystem. Both interconnect modules support link speeds of up to 4 Gb/s and include FC ports that automatically sense the correct bandwidth components (2-Gb or 1-Gb) for greater flexibility and investment protection. The Brocade switch and the McDATA switch (Figure 5) plug in the back of the GbE2 Interconnect Switch or the CGESM, and both switches ship with two SFP transceivers. Each server bay has a connection to a dedicated port on the 4-Gb SAN switch. The Brocade switch has four external-facing Fibre Channel ports, while the McDATA switch has two external ports. The Brocade switch supports interswitch link (ISL) trunking of the four Fibre Channel ports, which results in up to 16 Gb/s of direct SAN connectivity. For redundancy, two Brocade or McDATA switches can be installed in a p-Class enclosure and will provide 32 Gb/s direct SAN connectivity or 16 Gb/s direct SAN connectivity, respectively. The SAN switches also provide for 32 gigabits of server-to-server SAN bandwidth between processors in the enclosure.
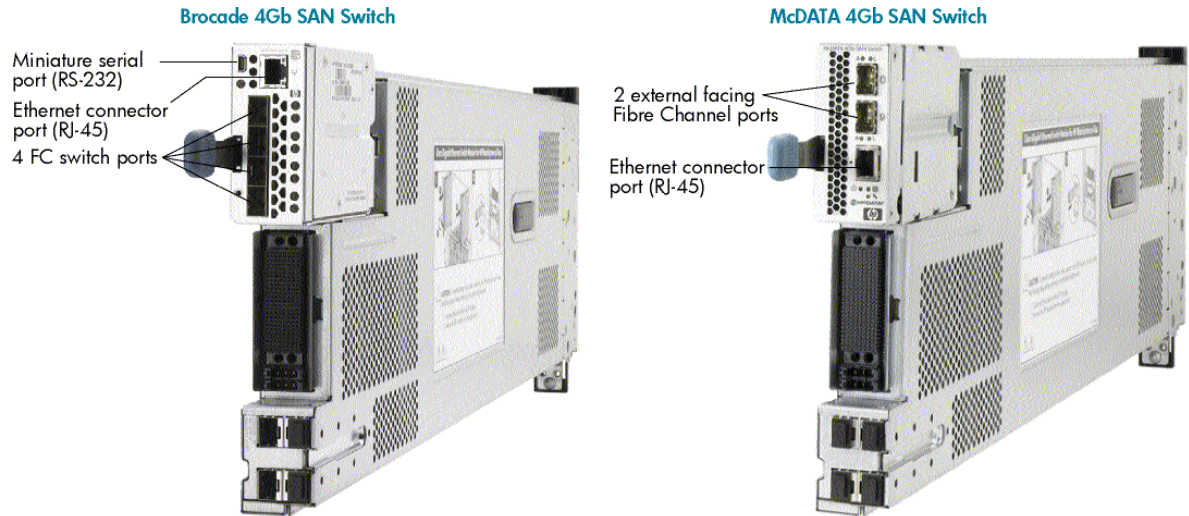
Table 1. Interconnect decision matrix

	Need Network Cable Reduction	Need all three NIC speeds 10/100/1000 from server blades	Need non switched up to 2 Gb FC from one or two servers to only one external FC device	Need FC Cable reduction and SFP reduction	Need switched FC to up to 16 servers	Need up to 4 Gb FC per external port to SAN	Need FC to Brocade SAN	Need FC to McData SAN
Patch Panel	NO	YES	NO	NO	NO	NO	NO	NO
Patch Panel 2	NO	YES	YES	NO	NO	NO	YES	YES
GbE	YES	NO	NO	NO	NO	NO	NO	NO
GbE2	YES	YES	NO	NO	NO	NO	NO	NO
GBE2 with FC Pass	YES	YES	YES	NO	NO	NO	YES	YES
GBE2 with B Imbeded FC	YES	YES	NO	YES	YES	YES	YES	NO
GBE2 with M Imbeded FC	YES	YES	NO	YES	YES	YES	NO	YES
CGSM	YES	YES	NO	NO	NO	NO	NO	NO
CGSM With FC Pass	YES	YES	YES	NO	NO	NO	YES	YES
CGSM with B Imbeded FC	YES	YES	YES	YES	YES	YES	YES	NO
CGSM with M Imbeded FC	YES	YES	YES	YES	YES	YES	NO	YES

Patch Panel   = Ethernet Patch Panel with no Fibre Channel
Patch Panel 2 = Patch Panel with built-in pass-thru for Direct Connection to HBA for FC;
                  no FC switching; requires 8 SFPs for each Patch Panel
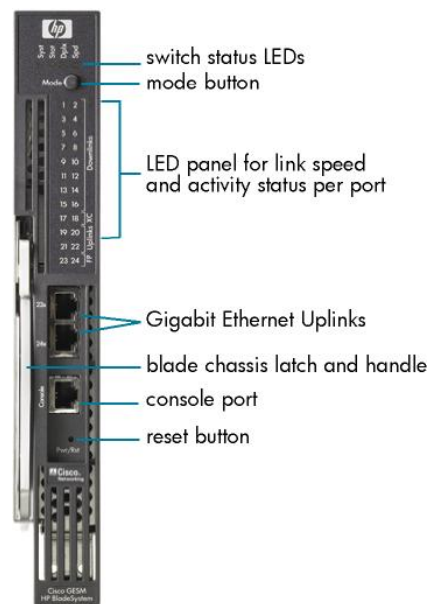GbE   = Gigabit Ethernet Network Switch with no Fibre Channel

Figure 5. Brocade 4-Gb SAN Switch (left) and McDATA 4-Gb SAN Switch (right)

Brocade 4Gb SAN Switch

Miniature serial port (RS-232)

Ethernet connector port (RJ-45)

4 FC switch ports

McDATA 4Gb SAN Switch

2 external facing Fibre Channel ports

Ethernet connector port (RJ-45)

Cisco Gigabit Ethernet Switch Module

The Cisco Gigabit Ethernet Switch Module (CGESM) is designed for seamless integration into the HP BladeSystem p-Class enclosure for improved efficiency, lower cost, and greater flexibility. The CGESM (Figure 6) is fully compatible with well-established Cisco technology standards, including the latest Cisco management, ASIC, and architecture standards. HP BladeSystem enclosures with integrated Cisco switches dramatically reduce the number of cables required to connect servers to the network. This integration reduces networking costs per port, reduces costs of cabling and equipment, and improves management efficiency.
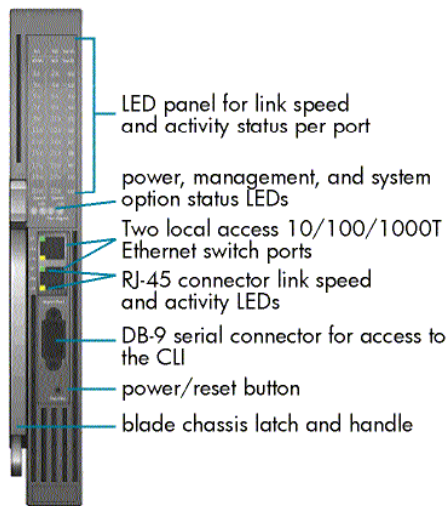
Figure 6. Front panel of Cisco Gigabit Ethernet Switch Module (CGESM)

switch status LEDs

mode button

LED panel for link speed and activity status per port

Gigabit Ethernet Uplinks

blade chassis latch and handle

console port

reset button

GbE2 Interconnect Kit

The GbE2 Interconnect Kit provides the ability to pass thru BL20p G3, BL25p, BL30p, BL35p, and BL45p Fibre Channel signals using the optional GbE2 Storage Connectivity Kit. Therefore, both Ethernet LAN signal consolidation and Fibre Channel SAN signal pass-thru are now possible with a single interconnect. The GbE2 Interconnect Switch chassis is simply used as a carrier to pass thru the Fibre Channel signals. The Ethernet LAN and the Fibre Channel SAN signals are completely isolated from each other, even though they share the common GbE2 Interconnect chassis. Figure 7 shows a front view of the GbE2 Interconnect Switch.
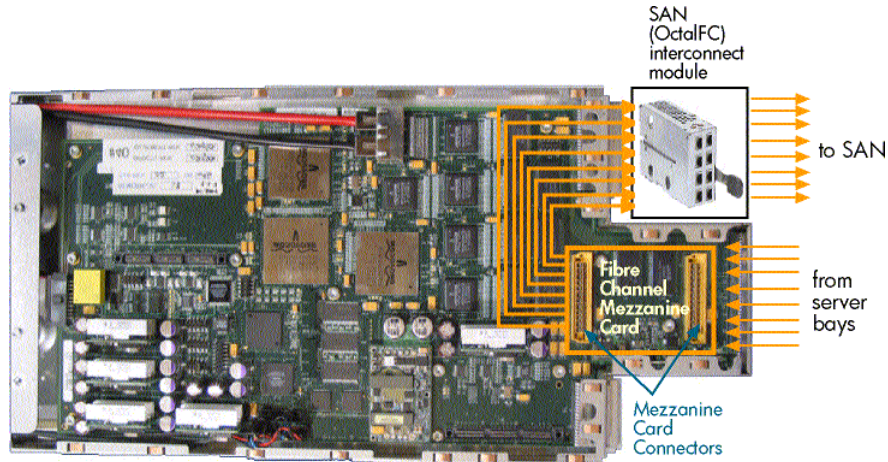
Figure 7. GbE2 Interconnect Switch

LED panel for link speed
and activity status per port

power, management, and system
option status LEDs

Two local access 10/100/1000T
Ethernet switch ports

RJ-45 connector link speed
and activity LEDs

DB-9 serial connector for access to
the CLI

power/reset button

blade chassis latch and handle

GbE2 Storage Connectivity Kit

The GbE2 Storage Connectivity Kit provides the components for a single p-Class server blade enclosure. This kit contains two GbE2 Fibre Channel mezzanine cards (one per switch) consisting of a retimer to recondition the Fibre Channel signals and two 8-port SAN (OctalFC) interconnect modules (Figure 8). The GbE2 Fibre Channel mezzanine card plugs into the connectors provided inside each GbE2 Interconnect Switch. An OctalFC interconnect module is installed into each interconnect bay from the back of the server blade enclosure. Each OctalFC interconnect module contains eight cages for pluggable SFP transceivers for connection to the SAN.

Figure 8. GbE2 Interconnect Switch with optional GbE2 Storage Connectivity Kit

Each ProLiant server blade has two Fiber Channel ports. The Fibre Channel signals from each port are routed through the enclosure backplane and to the chassis of each GbE2 Interconnect Switch, thus providing redundant, independent-path access to the SAN. The Fibre Channel signals travel through the GbE2 Fibre Channel mezzanine card (for signal conditioning) and then directly to the OctalFC interconnect module. The GbE2 Storage Connectivity Kit supports Fibre Channel port pass-thru from eight BL20p G3 or BL25p server blades (Figure 9), sixteen BL30p and BL35p server blades (Figure 10), and four BL45p server blades (not shown). Half of the Fibre Channel ports are routed through each GbE2 Interconnect Switch or CGESM chassis. The GbE2 Storage Connectivity Kit is not used with the ProLiant BL40p server blade; the server does not require routing the Fibre Channel ports to the interconnect bays.

Figure 9. Fibre Channel signal routing with two interconnect switches and the BL20p G3 or BL25p server blade
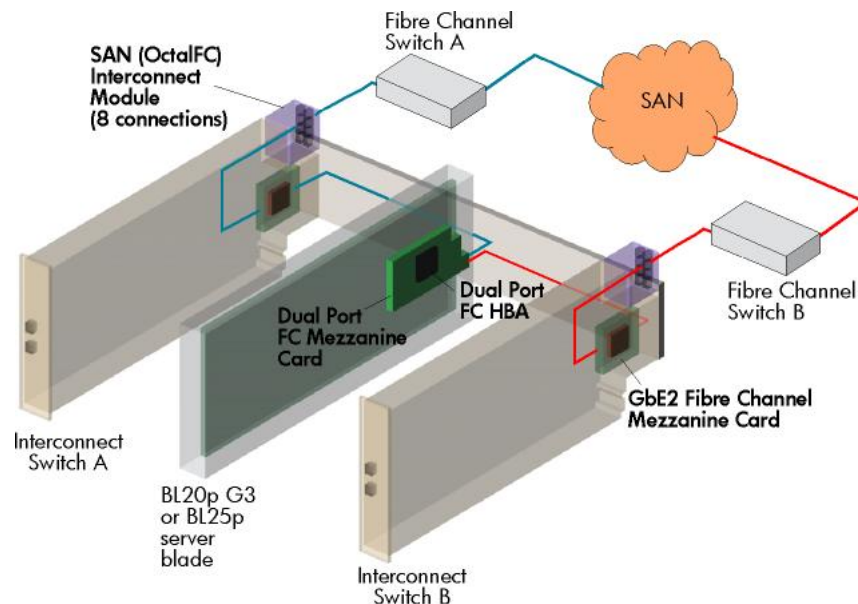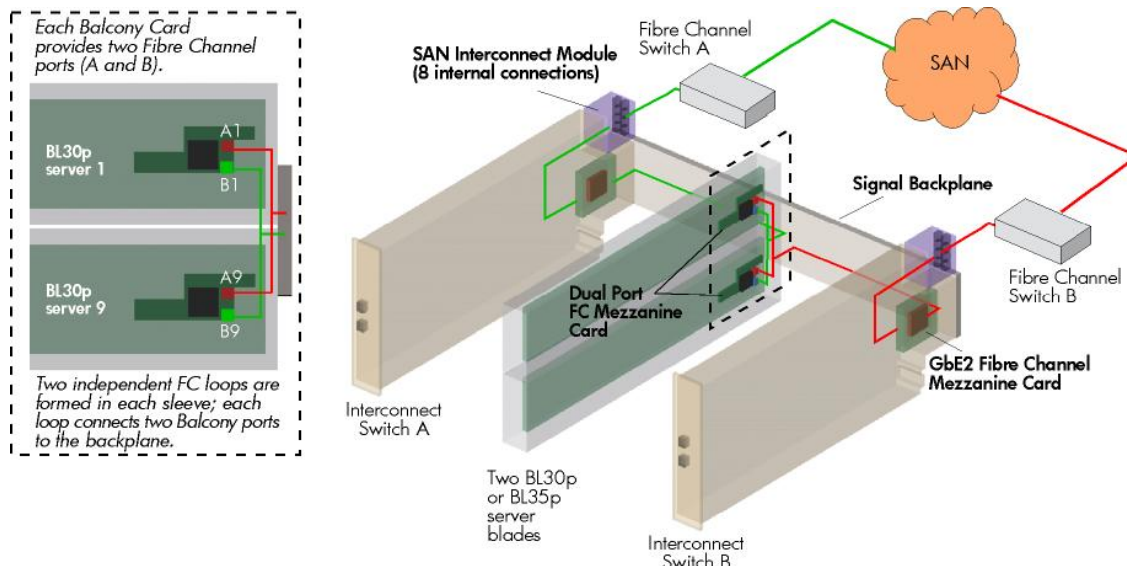
Figure 10. Fibre Channel signal routing with two interconnect switches and the BL30p or BL35p server blade

With the GbE2 Storage Connectivity Kit installed, both Fibre Channel SAN and Ethernet LAN ports are accessible at the rear of the server blade enclosure. Each port type exits on its dedicated interconnect module (Figure 11). The SAN OctalFC interconnect module has a robust connector assembly, and it includes a guide pin to ensure that the module is properly aligned as it is inserted. This unique modular design allows the switch to be hot-swapped in seconds without re-cabling.

Figure 11. Rear of server blade enclosure with both SAN and LAN interconnect modules installed
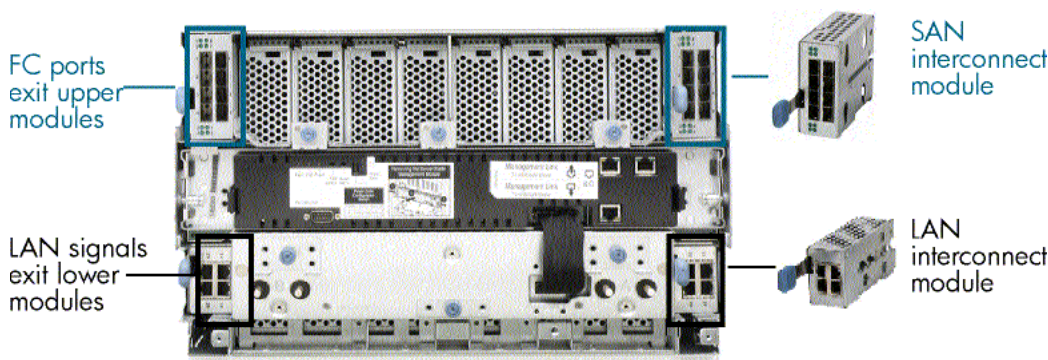
Configuring dual paths with half-height servers

To work properly, some dual path software requires that Fibre Channel addresses not be changed.

As indicated in Figure 10, the BL30p and BL35p servers form a Fibre Channel loop connecting one switch port to two servers in a sleeve. There are eight independent Fibre Channel loops. Each loop connects to a separate switch port. By default, the first server that comes up and logs into the switch will be assigned the first loop address. The second server that comes up will be assigned the next address. Since servers can come up in any order, they will get the first loop ID (address) or the second loop ID (address). The address will be changed if the HBAs do not request a specific address.

To work properly with dual path software, the adapters must be configured to request a specific Loop ID (address).

To configure the HBAs for a specific address, the user must bring up both servers that are in the sleeve and determine which addresses have been assigned to those servers. This can be accomplished by using the switch Graphical User Interface (GUI) to look at the name server entries for the switch port of the sleeve that the two servers are in.

If using an FC pass-thru module, the address can be determined by running HBAnyware for Emulex HBAs or SAN Surfer for Qlogic HBAs. Once the addresses of the HBAs have been determined, the user needs to give the command to the CLI or select in the GUI of HBAnyware (Figure 12) or SAN Surfer (Figure 13) to force the HBA to request the same Loop ID (address) in the future. The loop ID is just the lower order (right-most) hex digits of the address (1 through 255 decimal).

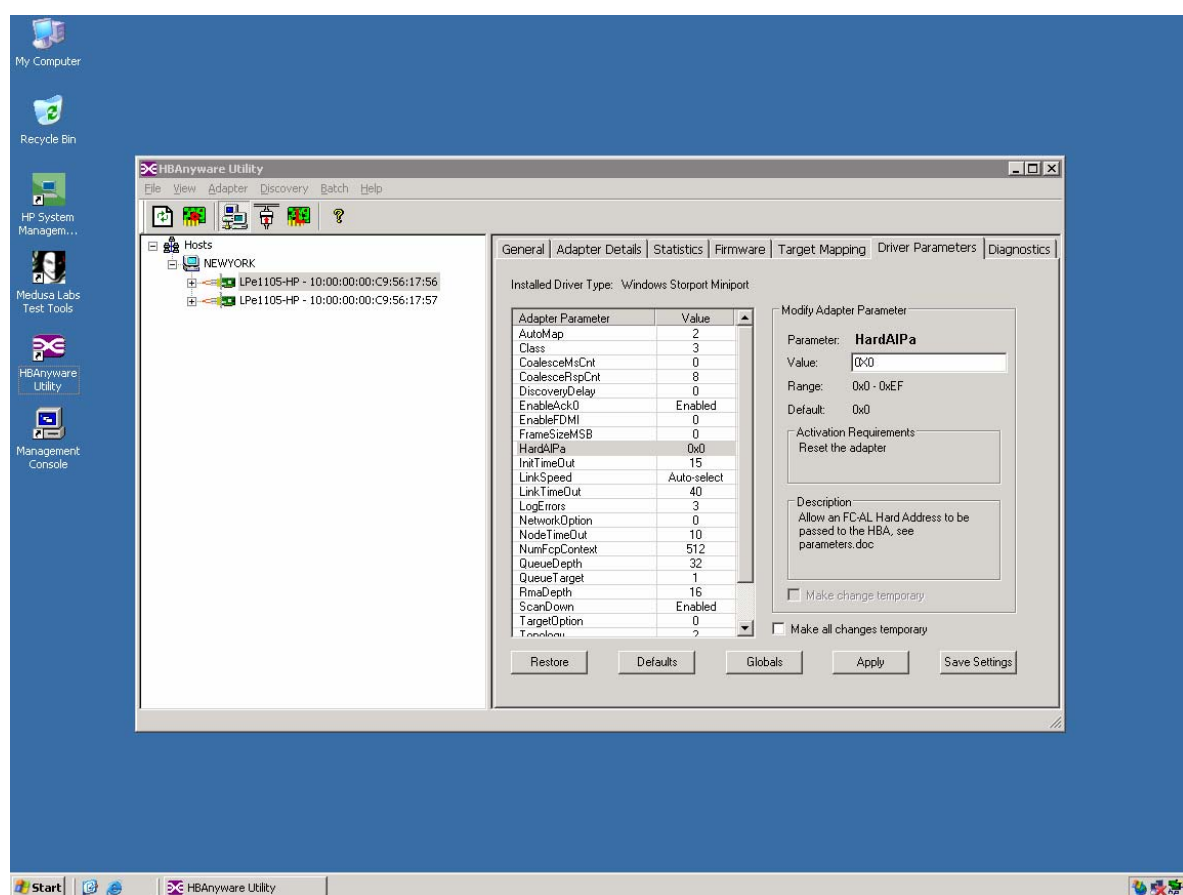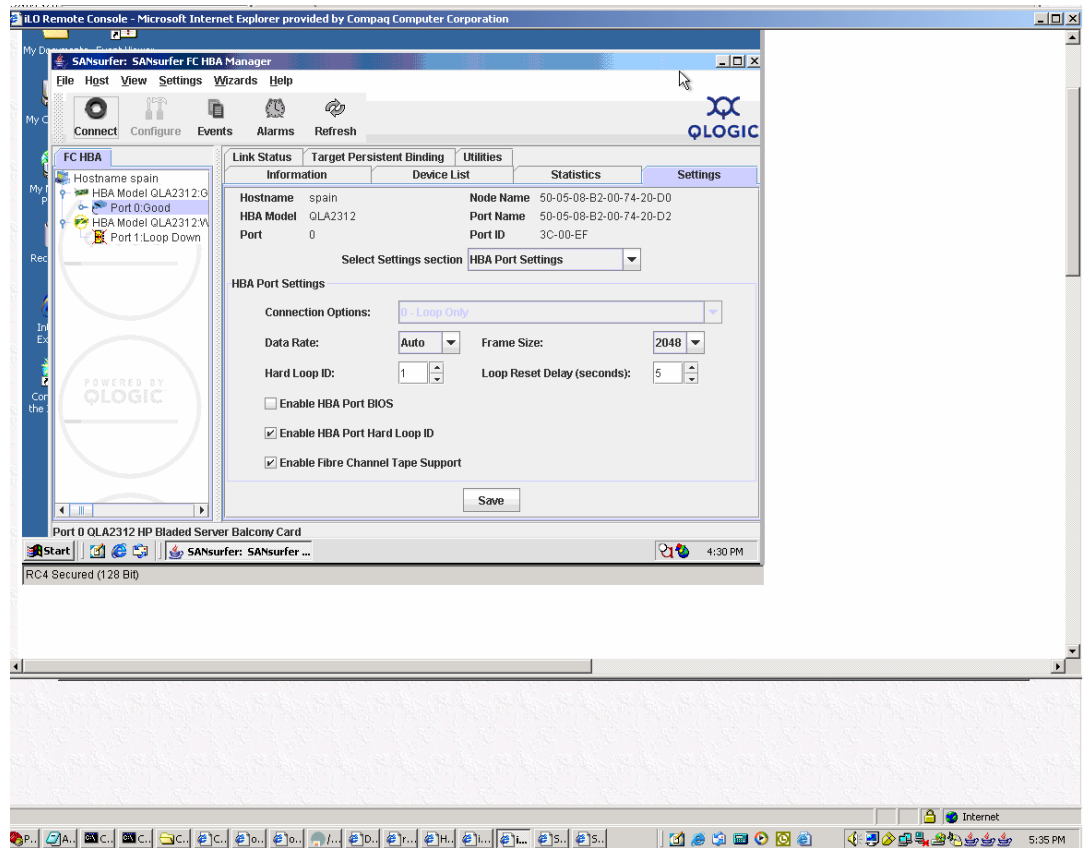**Figure 12.** HBAnyware screen showing where to select the Hard Fibre Channel Loop ID for Emulex HBAs

Figure 13. SAN Surfer screen showing where to select the Hard Fibre Channel Loop ID for Qlogic HBAs

RJ-45 Patch Panel 2 Kit

Another option to connect the ProLiant BL20p G3, BL25p, BL30p, BL35p and BL45p server blades to a SAN is to use the RJ-45 Patch Panel 2 Kit. The kit contains two Patch Panel 2 interconnects for one server blade enclosure (Figure 14). Each Patch Panel 2 interconnect allows Fibre Channel SAN ports to pass through to SAN devices. Connecting the server blades to a dual path SAN requires 16 Fibre Channel SFP modules and 16 Fibre Channel cables to external SAN switches. This option does not provide Fibre Channel switching; therefore, connecting a SAN device directly to one of the Fibre Channel ports on the patch panel will connect it to only one server bay. The servers cannot communicate with each other or share storage without an external SAN switch. The servers in all the bays will not have dual path, shared access to a Fibre Channel device unless the Fibre Channel device is connected via dual path to external SAN switches and the 16 Fibre Channel cables are connected to external Fibre Channel switches.

The RJ-45 Patch Panel 2 Kit provides 16 Fibre Channel ports to support up to eight ProLiant BL20p G3 server blades, sixteen BL30p and BL35p server blades, or four BL45p server blades. Each Patch Panel 2 routes the Fibre Channel signals from one server bay to one of the eight slots on the front panel for installation of the SFP FC transceivers that are included with the Dual Port Fibre Channel option for the servers (Figure 15).
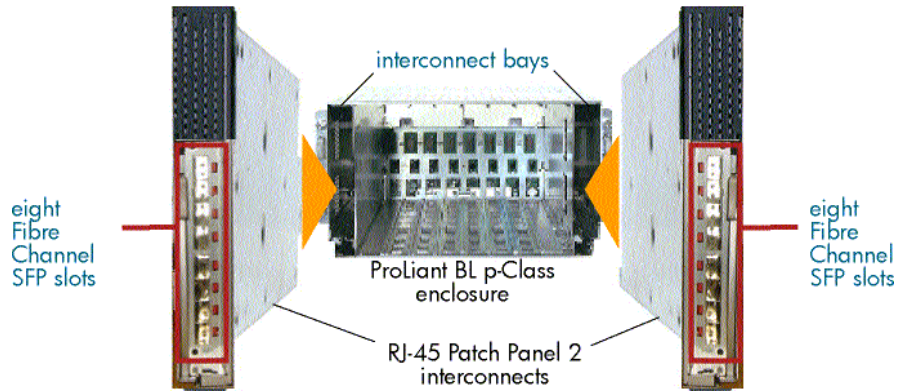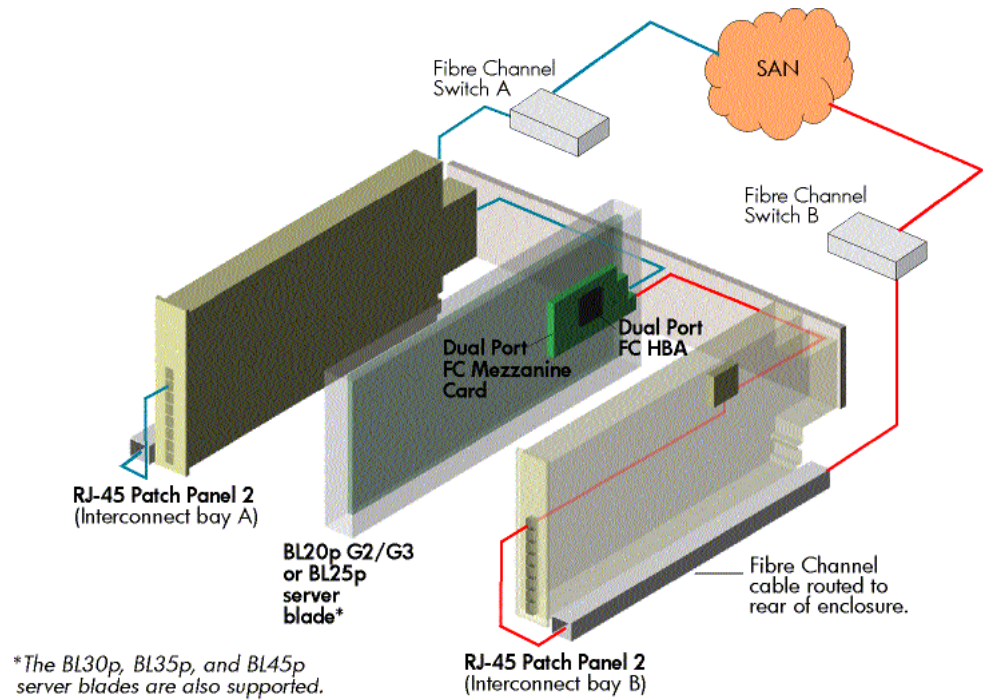
Figure 14. RJ-45 Patch Panel 2 Kit

eight Fibre Channel SFP slots

interconnect bays

eight Fibre Channel SFP slots

ProLiant BL p-Class enclosure

RJ-45 Patch Panel 2 interconnects

Figure 15. Fibre Channel signal routing using the RJ-45 Patch Panel 2

Fibre Channel Switch A

SAN

Fibre Channel Switch B

Dual Port FC HBA

Dual Port FC Mezzanine Card

RJ-45 Patch Panel 2 (Interconnect bay A)

BL20p G2/G3 or BL25p server blade*

Fibre Channel cable routed to rear of enclosure.

*The BL30p, BL35p, and BL45p server blades are also supported.

RJ-45 Patch Panel 2 (Interconnect bay B)

Note: For all servers to have dual path access to the SAN, 16 SFPs and 16 fiber optic cables and external switch ports with SFPs are required.

Software for SAN connectivity

The Brocade 4Gb SAN Switch for HP p-Class BladeSystem and the McData 4Gb SAN Switch for HP p-Class BladeSystem include easy-to-use GUIs for managing the switches. The GUI is part of the switch firmware and can be accessed by a web browser. See Switch Documentation at http://h20000.www2.hp.com/bizsupport/TechSupport/DocumentIndex.jsp?contentType=SupportManual&lang=en&cc=us&docIndexId=179911&taskId=101&prodTypeId=12169&prodSeriesId=471548

This section summarizes the functionality of the software required to connect ProLiant p-Class server blades to a SAN.

ProLiant Essentials Rapid Deployment Pack

The HP ProLiant Essentials Rapid Deployment Pack facilitates the installation, configuration, and deployment of high-volumes of server blades via a drag-and-drop, GUI-based console. For example, IT personnel can install operating systems, service packs, virus patches, and other software on computers using either scripting or imaging technology. The Rapid Deployment Pack combines two powerful products: Altiris eXpress Deployment Solution and the ProLiant Integration Module. Rapid Deployment Pack - Windows Edition 1.60 or later and Rapid Deployment Pack - Linux Edition 1.10 or later provide enhanced SAN support. For more information, select the web link for the RDP Knowledge Base in the "For more information" section.

An additional software tool for efficiently deploying HP BladeSystem p-Class server blades to a large existing SAN or to new SAN is HP Storage Essentials. It can be used to set up and manage the Brocade 4Gb SAN Switch for HP p-Class BladeSystem and the McData 4Gb SAN Switch for HP p-Class BladeSystem.

Conclusion

The Brocade 4-Gb SAN Switch for HP p-Class BladeSystem and the McData 4-Gb SAN Switch for HP p-Class BladeSystem provide high performance Fibre Channel switching and ease of installation for customers who already have or are purchasing the CGESM or the GbE2 Interconnect Module. The ProLiant BL20p G3, BL25p, BL30p, BL35p, and BL45p server blades and BL p-Class interconnect options (the Patch Panel 2 Kit, GbE2 Interconnect Kit, or two CGESMs) provide industry-standard SFP transceivers with LC optical connectors so that customers can connect to any Fibre Channel switch or other device that they prefer to use. The BL40p server can continue to be connected to external SAN switches.

For more information

For additional information, refer to the resources listed below.

Resource description	Web address
ProLiant BL p-Class Networking Overview white paper	http://h20000.www2.hp.com/bc/docs/support/SupportManual/c00429271/c00429271.pdf
ProLiant BL p-Class GbE2 Interconnect Switch Overview white paper	http://h20000.www2.hp.com/bc/docs/support/SupportManual/c00111950/c00111950.pdf
Care Pack (for hardware and software information and for orderable part numbers)	http://www.hp.com/hps/carepack/servers/
Rapid Deployment Pack Knowledge Base	http://www.hp.com/servers/rdp/kb

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